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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

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**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

7413-3

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/807167

INTERNATIONAL APPLICATION NO.
PCT/GB99/03169

INTERNATIONAL FILING DATE
October 11, 1999

PRIORITY DATE CLAIMED
October 09, 1998

TITLE OF INVENTION
FLOOR COVERING MATERIAL AND METHOD FOR PRODUCING SAME

APPLICANT(S) FOR DO/EO/US John Granville KAY, Michael Geoffrey MINETT,
Grenville SEAGER, Adrian Lance ENTWISTLE, and Craig Lee CROSBY

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(3)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19(35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C.371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). unsigned
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
 - a. PCT Specification as originally filed
 - b. International Publication

Express Mail Label No.: EL414480435US
Date of Deposit: April 09, 2001
I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20531.
Thomas Henry
Signature of person mailing paper or fee

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09/807167

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7394-2:TQH:109248

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:) Express Mail No. EL414480435US
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John Granville Kay et al.)
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Serial No. (unknown))
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Filed Herewith)
)
FLOOR COVERING MATERIAL)
AND METHOD FOR PRODUCING SAME))
)
US National Stage of PCT/GB99/03169)
International Filing Date October 11, 1999)

PRELIMINARY AMENDMENT

Hon. Assistant Commissioner of Patents

Washington, D.C. 20231

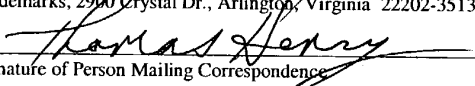
Sir:

Please enter the following Preliminary Amendment in the above-identified patent application. The Commissioner is hereby authorized to charge payment of any additional fees associated with this application or credit any overpayment to Deposit Account No. 23-3030.

IN THE CLAIMS

Please cancel claims 2-25.

"Express Mail" label number EL414480435US. Date of Deposit April 9, 2001. I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Dr., Arlington, Virginia 22202-3513.

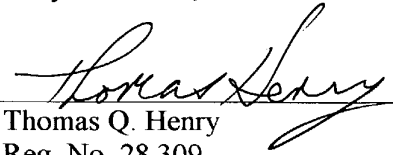

Signature of Person Mailing Correspondence

REMARKS

Consideration of the above-identified patent application is requested.

Respectfully submitted,

By: _____


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FLOOR COVERING MATERIAL

This invention relates to a material for use as a floor covering as well as a method for the production thereof.

Floor coverings based upon PVC are used extensively. Commonly they are produced by spreading a PVC plastisol onto a carrier substrate, often glass fibre, and then heat-curing the PVC. Such PVC floor coverings have the advantages of being inexpensive, easily coloured/patterned and combine longevity with ease of maintenance. However, a drawback of such floor coverings is that, although when dry they provide an adequate coefficient of friction (COF) to prevent users slipping, the COF can drop to dangerously low levels when the floor covering is wet, e.g. due to water carried by the feet of persons walking on the floor covering or because the floor covering is used in an environment where water may be spilt.

It is generally considered that a floor covering, when wet, should have a COF of at least 30 to prevent slipping. This value is usually achieved by one of the following methods.

- a) An abrasive aggregate such as quartz, silicon carbide or corundum is incorporated into the wear surface during production of the floor covering. The aggregate provides a surface roughness which "breaks up" any water film thereon.
- b) The texture of the floor covering is embossed to produce a high friction pattern.
- c) A water absorbing filling agent such as cork is added as a filler during production.

Most manufactures have concentrated on the first method (i.e. (a)) to increase the COF. In this method the aggregate is embedded into the surface of the plastisol layer while it is still soft during manufacture of the floor covering . This ensures that the final floor covering has a roughened surface to provide the desired frictional properties. Furthermore, the aggregate can be used to give a decorative effect. For example, silicon carbide gives a shiny effect and quartz can be coloured.

However, when aggregates are used to increase the COF of PVC flooring there is a compromise between a higher COF and an increased maintenance effort. A floor covering with embedded aggregates tends to get dirty more quickly than an untreated floor covering as the aggregate removes dirt from footwear. Such dirt is difficult to remove from the surface of the flooring since it becomes embedded in the texture created by the aggregate. This effect is exacerbated by the nature of the plasticised PVC formulation which tends to have a high affinity for dirt and grease. Quite often a rigorous cleaning regime is required for thoroughly removing the dirt and grease and inadequate cleaning can give rise to hygiene problems.

A further problem with plasticised-PVC type floor coverings is that they can stain easily. Thus, for example, oils, fats and greases lead to yellow staining of PVC, which can therefore easily be discoloured when used in a kitchen. Certain cleaning agents also contain dyestuffs that are picked up by the PVC and this is a further source of discoloration. The staining of PVC is obviously undesirable from an aesthetic point of view.

A further problem is that fats (e.g. as may be split in a kitchen) can soften the PVC leading to increased slippiness, undermining the effect of the aggregate.

In the case of PVC floor coverings which do not include aggregates, it is known to incorporate a surface barrier coating which prevents stains. The surface coating reduces the floor covering's susceptibility to picking up stains and dirt. The coating typically lasts between 6-12 months and further lowers the frequency that the

floor covering must be cleaned. However, such a coating cannot be applied over a PVC floor covering having aggregates embedded therein, as the coating covers the aggregate and reduces its efficacy.

It is therefore an object of the present invention to produce a floor covering that provides a sufficient COF, when wet, combined with ease of maintenance.

According to a first aspect of the present invention there is provided a floor covering material comprising a PVC layer and having aggregate embedded in the material for providing surface roughness wherein the material incorporates a barrier layer of polymeric material other than PVC fused into the upper surface of the PVC layer, the aggregate being exposed at the surface of the barrier layer.

The floor covering material of the invention thus incorporates aggregate providing surface roughness and a barrier layer fused into the upper surface of the PVC layer. Since the barrier layer is fused into the upper surface of the PVC layer (and for this reason is other than PVC), the floor covering material comprises the PVC layer, the barrier layer and (between these two layers) a transition region which is comprised of both the PVC and the polymer of the barrier layer. Surface roughness is achieved by ensuring that a portion of the aggregate material is exposed at the surface of the barrier layer. Thus, for example, the aggregate may be proud of the barrier layer or may have an exposed surface at the level of the barrier layer surface. The barrier layer serves to protect the underlying PVC layer from discoloration and softening as described above. The material of the invention thus has the two-fold advantage of slip resistance (as provided by the surface aggregate) and protection of the PVC layer. Moreover the composition of the barrier layer may be chosen to impart at least one further desired characteristic for the floor covering material, e.g. enhanced stain resistance, dirt release and/or heat resistance. By this means, desirable surface properties for the PVC flooring (e.g. enhanced dirt release, stain resistance etc) can be achieved without adversely affecting slip performance as occurs with conventional coating processes.

Furthermore provided that the aggregate is embedded in the PVC layer then slip resistance is maintained even if the barrier layer becomes worn away. Additionally, even when the barrier layer proper is worn away, there is then exposed the aforementioned transition region which still provides a degree of barrier function.

Preferably the barrier layer is of a cured polymer material but we do not preclude the possibility of the barrier layer being thermoplastic.

Preferably the barrier layer is at least as flexible as the underlying PVC layer so as not to crack during normal use and handling of the product. Preferably also the barrier layer is transparent or translucent.

The barrier layer may for example comprise a polyolefin, (co-)polyester, (co-)polyamide, polyurethane, phenol formaldehyde, epoxy or acrylic polymer or a mixture of the polymers.

It is also preferred that the floor covering material has an embossed surface. Such embossing serves to help retain the aggregate material in the surface of the material.

The aggregate material may for example be quartz, corundum, and/or silicon carbide.

According to a second aspect of the present invention there is provided a method of producing a floor covering material comprising

- (a) spreading a PVC plastisol on a substrate,

- (b) distributing over the surface of the plastisol a powder of a film forming, heat fusible polymeric material other than PVC and a particulate aggregate material, and
- (c) effecting heating to fuse the plastisol and convert the powder into a film,

steps (b) and (c) being effected such that aggregate is exposed at the surface of the film.

The method of the invention may be effected semi-continuously by withdrawing a web of the substrate material from a roll thereof and moving the travelling web successively through the steps of the method identified above.

In step (a) of the above process, the substrate is for preference glass fibre although other materials may be used. The PVC plastisol may be spread onto the substrate using a knife-over-roller coating process. Typically the plastisol is applied to the substrate to a thickness of 1.5 to 3.5mm.

The powdered polymeric material used in step (b) may be a thermoplastic but is more preferably a material which becomes cured at a subsequent stage in the process. Thus, the polymeric material may be heat curable and become cured in step (c) of the process or may be a radiation (e.g. UV) curable system which is subjected to cross-linking in a step subsequent to (c).

The powder employed in step (b) should be one which is compatible with the PVC plastisol so that the polymer is converted to a film which bonds to the PVC layer in the floor covering. The film of the polymer should have a similar co-efficient of thermal expansion to the PVC layer. Given that the PVC layer is flexible then the film should be at least as flexible so as not to crack during normal use and handling of the product.

In step (b) of the process. The powder may be distributed over the plastisol either before, after or simultaneously with the aggregate. If the powder is distributed before the aggregate then the powder on the plastisol may be softened (e.g. using a medium wave infra-red heater) to a semi-molten state to allow more ready acceptance of the aggregate onto the surface. If the powder and aggregate are distributed onto the plastisol simultaneously then softening of the powder may once again be effected prior to step (c). Alternatively, as indicated, the aggregate may be distributed over the plastisol prior to the powder. Excess powder. (e.g. that which is covering the aggregate or which has not otherwise become absorbed in the plastisol) may be removed prior to step (c). Such removal may for example be effected by suction, (using a vacuum) or blowing such as by using an air knife.

Typically the amount of powder applied is 10 to 100gm⁻², more preferably 30-70 gm⁻². The powder preferably has a particle size below 200 microns, more preferably below 100 microns. It is particularly preferred that the mean particle size is in the range 40-60 microns. Further details of powders which may be used are given below.

A wide variety of particulate aggregate materials may be used. Suitable examples include quartz, silicon carbide or corundum as conventionally used for providing surface roughness in floor coverings. The particle size of the aggregate is preferably in the range 0.5 to 1.00mm and is incorporated into the surface at a density of 50 to 200g m⁻².

In step (c), the heating may be effected in a drying oven using a temperature of 190-200°C. This will fuse the plastisol and melt the powder polymeric material to form a uniform film on the plastisol surface. If the powder is thermally cross-linkable then the cross-linking step (c) will be effected whilst the material is in the oven. If the powder is of a uv cross-linkable polymeric system then cross-linking may be effected in a subsequent step using uv lamps.

It is particularly preferred that pressure is applied to the surface of the material (e.g. by an embossing operation) after the heating operation (step (c)) but whilst the plastisol is still soft to produce a textured surface. This pressure application step assists in retention of the aggregate in the surface.

The powdered polymeric material used in step (b) may be a thermoplastic (thermofusible) material. Thermofusible materials flow to form a molten film on the plastisol and solidify on cooling. Examples of thermofusible materials which may be used include:

- i) polyester co-polymers (e.g. having a DSC melting range of 90-120°C, and a Melt Flow Index (MFI) of 15-40g/10 min under an applied load of 2.16 kg);
- ii) co-polyamides (e.g. having a DSC melting range of 80-130°C, and an MFI of 15-95g/10 min under an applied load of 2.16 kg); and
- iii) polyolefins (e.g. having a DSC melting range 100-135°C, and an MFI of 10-95 g/10 min under an applied load of 2.16 kg).

Examples of polyolefins which may be used include polyethylenes and ethylene-propylene copolymers.

Thermofusible polymeric coatings (e.g. of the type defined under (i)-(iii) above) give improved soiling, chemical and staining resistance with no adverse effects on the slip resistance of the floor covering. The thermofusible polymers can either be used alone or blended to suit specific requirements.

It is however more preferred to use, as the polymeric material for step (b), a curable resin system. Such a resin system may be a thermosetting resin or a uv curable resin.

Thermosettable materials flow into a molten film on the plastisol substrate and are cross-linked by a heat activated cross-linking mechanism. Examples of thermosettable polymeric systems which may be used in the method of the invention include:

- a) epoxy resins, e.g. phenol formaldehyde resins and epichlorhydrin cured with aminic curing agents known in the art, such as benzyldimethylamine and dicyanamide;
- b) polyesters with hydroxyl or carboxyl end groups, cured with blocked isocyanates, e.g. caprolactam-isocyanate products;
- c) polyurethanes cured with blocked isocyanates; and
- d) acrylics incorporating epoxy resins and polyesters to allow curing with blocked isocyanates.

Thermosettable polymeric materials give the same benefits as those of thermofusible polymeric coatings but with the additional advantage of enhanced durability and staining resistance. The polymers can either be used alone or blended to suit specific requirements.

UV curable polymeric materials flow to form a molten film on the plastisol during step (c) and may cross-linked by the action of uv light subsequent to step (c). The following compounds may for example, be used as UV curable coatings on the floor covering:

- a) UV curable polyesters e.g. unsaturated polyesters, cross-linked by free radical initiated polymerisation using curing agents known in the art, e.g. diacetoneacrylamide; and
- b) Bifunctional epoxy resins, cross-linked by cationic photoinitiated polymerisation using photoinitiators known in the art e.g. ferrocenium salts.

UV curable polymeric materials demonstrate similar benefits to those of thermoset polymeric coatings but with additional processing advantages in that the cross-linking reaction can be controlled separately from the plastisol fusion process. The polymers can either be used alone or blended to suit specific requirements.

For UV curable systems employed in the invention, there may be some thermal cross-linking in step (c) and depending on the resin used the UV-curing step may also need to be effected at elevated temperature.

For all embodiments of the method of the invention, it is possible for the powder (which forms the barrier layer) to include at least one of a flow modifying agent, a flame retardant agent, a biocide, a gloss modifier, a matting agent or other coating technology additive well known in the art.

In a typical embodiment of the method of the invention, a floor covering material is formed by the following steps.

(i) PVC plastisol is spread onto a substrate web (e.g. glass fibre) drawn from a roll thereof using a knife-over-roller coating process.

(ii) Powder (for forming the barrier layer) and aggregate are distributed over the plastisol either simultaneously or in any order. If the powder is applied first, then it may be softened, (e.g. using a MWIR) prior to application of the aggregate. If the aggregate is applied prior to the powder then excess powder (i.e. that which is non-absorbed in, or not adhered to, the plastisol) may be removed, e.g. by using suction or by blowing-off with an air knife prior to step (iii) below.

(iii) The web material resulting from (ii) is then passed through an oven to fuse the plastisol and convert the powder to a film. If the powder is of a thermally curable resin then cross-linking will be effected in the oven. If however the powder is of a uv-curable resin then there would be a subsequent uv-curing stage.

(iv) Optionally the web may be embossed. In the case where there is a uv-curing stage, embossing preferably takes place before uv-curing but can take place after.

(v) The thus formed web material may then be passed through curing and accumulator stages as conventional in the manufacture of PVC flooring.

The invention will be further described by way of example only with reference to Fig 1 of the accompanying drawings which illustrates one embodiment of floor covering in accordance with the invention.

As shown in the drawing, a floor-covering 1 in accordance with the invention, comprises a backing layer 2 (e.g. of glass fibre), a PVC layer 3 (as represented by the small triangles) an upper barrier layer 4 (produced from the powdered material discussed above) and a transition region 5 formed between layers 3 and 4. This transition region 5 is, in effect, where the barrier layer 4 is fused to the PVC layer 3 and incorporates both the material of the barrier layer and PVC. Also included in the floor covering 1 are particles of aggregate 6 (e.g. silicone carbide) which are embedded in the PVC layer and which are exposed at the barrier layer.

The method of the invention may be effected semi-continuously by withdrawing a web of the substrate material from a roll thereof and moving the travelling web successively through the steps of the method identified above.

CLAIMS

1. A floor covering material comprising a PVC layer and having aggregate embedded in the material for providing surface roughness wherein the material incorporates a barrier layer of polymeric material other than PVC fused into the upper surface of the PVC layer, the aggregate being embedded in the PVC layer whilst also being exposed at the surface of the barrier layer.
2. A material as claimed in claim 1 wherein the barrier layer is of a cured polymeric material.
3. A material as claimed in claim 1 wherein the barrier layer is of a thermoplastic material.
4. A material as claimed in any one of claims 1 to 3 wherein the barrier layer is at least as flexible as the underlying PVC layer.
5. A material as claimed in any one of claims 1 to 4 wherein the barrier layer is transparent or translucent.
6. A material as claimed in any one of claims 1 to 5 wherein the polymeric material of the barrier layer provides enhanced dirt release and/or stain resistance in comparison to the PVC.
7. A material as claimed in any one of claims 1 to 6 wherein the barrier layer comprises a polyolefin, (co-)polyester, (co-)polyamide, polyurethane, phenol formaldehyde, epoxy or acrylic polymer or a mixture thereof.

8. A material as claimed in any one of claims 1 to 7 wherein the floor covering material has an embossed surface.
9. A material as claimed in any one of claims 1 to 8 wherein the aggregate is quartz, corundum, and/or silicon carbide.
10. A method of producing a floor covering material comprising
 - (a) spreading a PVC plastisol on a substrate,
 - (b) distributing over the surface of the plastisol a powder of a film forming, heat fusible polymeric material other than PVC and a particulate aggregate material, and
 - (c) effecting heating to fuse the plastisol and convert the powder into a film,steps (b) and (c) being effected such that aggregate is embedded in the PVC layer whilst also being exposed at the surface of the film.
11. A method as claimed in claim 10 wherein the powder is distributed over the plastisol prior to the aggregate material.
12. A method as claimed in claim 11 wherein the powder applied to the plastisol is softened prior to distribution of the aggregate.
13. A method as claimed in claim 10 wherein the powder is distributed over the plastisol simultaneously with the aggregate.

14. A method as claimed in claim 10 wherein the aggregate is distributed over the plastisol prior to the powder .
15. A method as claimed in claim 14 wherein excess powder is removed from the plastisol prior to step (c).
16. A method as claimed in claim 15 wherein the excess powder is removed by suction.
17. A method as claimed in any one of claims 10 to 16 wherein the powder is a thermoplastic material.
18. A method as claimed in any one of claims 10 to 16 wherein the powder is of a curable resin system.
19. A method as claimed in claim 18 wherein said resin system is cured by heat and curing is effected in step (c).
20. A method as claimed in claim 18 wherein the resin system is curable by UV-radiation.
21. A method as claimed in claim 20 wherein UV curing is effected subsequent to step (c).
22. A method as claimed in any one of claims 10 to 21 wherein the powder comprises a polyolefin, (co-)polyester, (co-)polyamide, polyurethane, phenol formaldehyde, epoxy or acrylic polymer or a mixture thereof.
23. A method as claimed in any one of claims 10 to 22 wherein embossing is applied subsequent to step (c).

24. A method as claimed in any one of claims 10 to 23 wherein the aggregate is quartz, corundum and/or silicon carbide.

25. A method as claimed in any one of claims 10 to 24 wherein the powder incorporates at least one of a flow modifying agent, a flame retardant, a biocide, a gloss modifier and a matting agent.

PCT

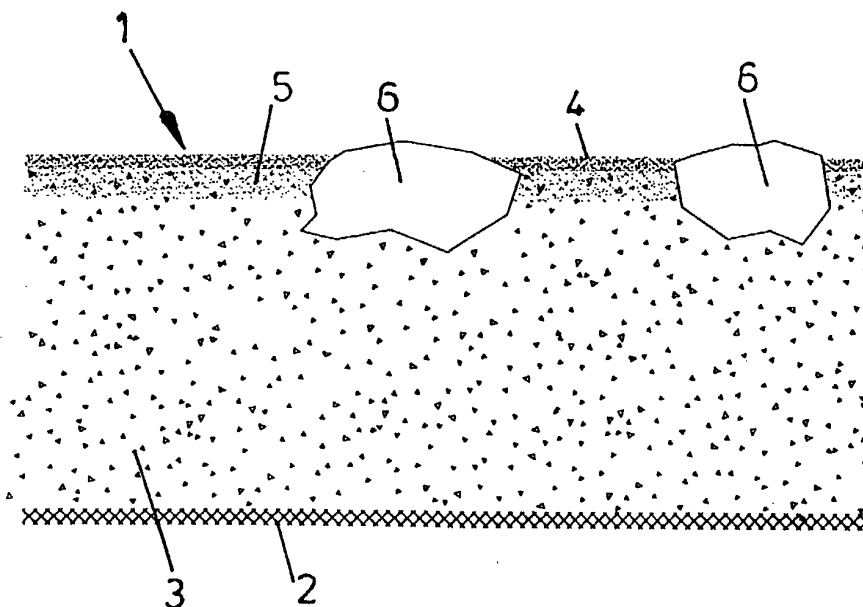
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : D06N 7/00, B29C 70/64</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/22225 (43) International Publication Date: 20 April 2000 (20.04.00)</p>
<p>(21) International Application Number: PCT/GB99/03169 (22) International Filing Date: 11 October 1999 (11.10.99) (30) Priority Data: 9822019.7 ✓ 9 October 1998 (09.10.98) GB (71) Applicant (for all designated States except US): JAMES HALSTEAD LIMITED [GB/GB]; P.O. Box 3, Radcliffe New Road, Whitefield, Manchester M45 7NR (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): <u>KAY, John</u>, Granville [GB/GB]; 5 White Brow, Bury, Manchester BL9 8BT (GB). <u>MINETT, Michael, Geoffrey</u> [GB/GB]; 14 St. Austell's Drive, Prestwich, Manchester M25 1LZ (GB). <u>SEAGER, Grenville</u> [GB/GB]; 87 Bury New Road, Whitefield, Manchester M45 7EG (GB). <u>ENTWISTLE, Adrian, Lance</u> [GB/GB]; 410 Rochdale Road, Britannia, Bacup, Lancashire OL12 9SD (GB). <u>CROSBY, Craig, Lee</u> [GB/GB]; 81 Staley Hall Road, Stalybridge, Cheshire SK15 3DP (GB). (74) Agent: ATKINSON, Peter, Birch; Marks & Clerk, Sussex House, 83-85 Mosley Street, Manchester M2 3LG (GB).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>

(54) Title: FLOOR COVERING MATERIAL AND METHOD FOR PRODUCING SAME



(57) Abstract

A floor covering material (1) comprising a PVC layer (3) having embedded aggregate (6) for providing surface roughness. The material incorporates a barrier layer (4) of polymeric material other than PVC fused into the upper surface of the PVC layer (3), the aggregate (6) being exposed at the surface of the barrier layer (4).

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PTO/SB/01 (10-00)
 Approved for use through 10/31/2002. OMB 0651-0032
 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input checked="" type="checkbox"/> Declaration Submitted with Initial Filing unsigned OR <input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	7413-3
	First Named Inventor	John Granville KAY
	COMPLETE IF KNOWN	
	Application Number	/
	Filing Date	
	Group Art Unit	
	Examiner Name	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

FLOOR COVERING MATERIAL AND METHOD FOR PRODUCING SAME

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 10/11/1999 as United States Application Number or PCT International

Application Number PCT/GB99/03169 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
9822019.7	GB	10/09/1998	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
99/03169	GB	10/11/1999	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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or Bar Code LabelOR ☒

Correspondence address below

Name Thomas Q. Henry @ WOODARD, EMHARDT, NAUGHTON, MORIARTY & MCNETT**Address** Bank One Center/Tower, Suite 3700**Address** 111 Monument Circle**City** Indianapolis**State** IN**ZIP** 46204**Country** US**Telephone** 317-634-3456**Fax** 317-637-7561

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR :☐ A petition has been filed for this unsigned inventor**Given Name**

(first and middle (if any)) John Granville

Family Name

or Surname KAY

**Inventor's
Signature****Date****Residence: City** Manchester**State****Country** GB**Citizenship** GB**Mailing Address** 5 White Brow**Mailing Address** Bury, Manchester BL9 8BT**City** Manchester**State****ZIP** BL9 8BT**Country** GB**NAME OF SECOND INVENTOR:**☒ A petition has been filed for this unsigned inventor**Given Name**

(first and middle (if any)) Michael Geoffrey

Family Name

or Surname MINETT

**Inventor's
Signature****Date****Residence: City** Manchester**State****Country** GB**Citizenship** GB**Mailing Address** 14 St. Austell's Drive**Mailing Address** Prestwich, Manchester M25 1LZ**City** Manchester**State****ZIP** M25 1LZ**Country** GB☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet Page <u>1</u> of <u>1</u>
--------------------	---

Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Grenville		SEAGER	
Inventor's Signature		Date	
Residence: City Manchester	State	Country GB	Citizenship GB
Mailing Address 87 Bury New Road			
Mailing Address Whitefield, Manchester M45 7EG			
City Manchester	State	ZIP M45 7EG	Country GB
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Adrian Lance		ENTWISTLE	
Inventor's Signature		Date	
Residence: City Lancashire	State	Country GB	Citizenship GB
Mailing Address 410 Rochdale Road			
Mailing Address Brittania, Bacup, Lancashire OL12 9SD			
City Lancashire	State	ZIP OL12 9SD	Country GB
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Craig Lee		CROSBY	
Inventor's Signature		Date	
Residence: City Cheshire	State	Country GB	Citizenship GB
Mailing Address 81 Staley Hall Road			
Mailing Address Stalybridge, Cheshire SK15 3DP			
City Cheshire	State	ZIP SK15 3DP	Country GB

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INFORMATION
(Supplemental Sheet)**

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Harold R. Woodard	#16,214		
C. David Emhardt	#18,483		
Joseph A. Naughton, Jr.	#19,814		
John V. Moriarty	#26,207		
John C. McNett	#25,533		
Thomas Q. Henry	#28,309		
James M. Durlacher	#28,840		
Charles R. Reeves	#28,750		
Vincent O. Wagner	#29,596		
Steve Zlatos	#30,123		
Spiro Bereveskos	#30,821		
William F. Bahret	#31,087		
Clifford W. Browning	#32,201		
R. Randall Frisk	#32,221		
Daniel J. Lueders	#32,581		
Kenneth A. Gandy	#33,386		
Timothy N. Thomas	#35,714		
Kerry P. Sisselman	#37,237		
Kurt N. Jones	#37,996		
John H. Allie	#39,088		
Holiday W. Banta	#40,311		
Troy J. Cole	#35,102		
L. Scott Paynter	#39,797		
J. Andrew Lowes	#40,706		
Charles J. Meyer	#41,996		
Matthew R. Schantz	#40,800		
Gregory B. Coy	#40,967		
Lisa A. Hiday	#40,036		
John V. Daniluck	#40,581		
Christopher A. Brown	#41,642		
C. John Brannon	#44,557		
Jason J. Schwartz	#43,910		
Arthur J. Usher, IV	#41,359		
Douglas A. Collier	#43,556		
Brad A. Schepers	#45,431		
James B. Myers	#42,021		
Scott J. Stevens	#29,446		
John M. Bradshaw	#46,573		
C. Amy Ng Smith	#42,931		
Charles P. Schmal	#45,082		
Edward E. Sowers	#36,015		

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**DECLARATION FOR UTILITY OR
DESIGN
PATENT APPLICATION
(37 CFR 1.63)**

☒ Declaration Submitted with Initial Filing unsigned **OR** ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number 7413-3
First Named Inventor John Granville KAY

COMPLETE IF KNOWN

Application Number 09/807,167
Filing Date
Group Art Unit
Examiner Name

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

FLOOR COVERING MATERIAL AND METHOD FOR PRODUCING SAME

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 10/11/1999 as United States Application Number or PCT International

Application Number PCT/GB99/03169 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
9822019.7 99/03169	GB	10/09/1998 10/11/1999	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				<input type="checkbox"/>	<input checked="" type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION — Utility or Design Patent ApplicationDirect all correspondence to: ☐ Customer Number OR ☒ Correspondence address belowName Thomas Q. Henry @ WOODARD, EMHARDT, NAUGHTON, MORIARTY & MCNETTAddress Bank One Center/Tower, Suite 3700Address 111 Monument CircleCity IndianapolisState INZIP 46204Country USTelephone 317-634-3456Fax 317-637-7561

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: J. Granville☐ A petition has been filed for this unsigned inventor

Given Name

(first and middle (if any)) John Granville

Family Name

or Surname KAYInventor's
Signature J. Kay4th May 2001

Date

Residence: City ManchesterState GBCountry GBCitizenship GBMailing Address 5 White BrowMailing Address Bury, Manchester BL9 8BTCity Manchester

State

ZIP BL9 8BTCountry GBNAME OF SECOND INVENTOR: M. Geoffrey☒ A petition has been filed for this unsigned inventor

Given Name

(first and middle (if any)) Michael Geoffrey

Family Name

or Surname MINETTInventor's
Signature M. a. Minett30TH APRIL


Date

2001Residence: City ManchesterState GBCountry GBCitizenship GBMailing Address 14 St. Austell's DriveMailing Address Prestwich, Manchester M25 1LZCity Manchester

State

ZIP M25 1LZCountry GB☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 3 of 5

Name of Second Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.					
Given Name (first and middle (if any))				Family Name or Surname			
Michael Geoffrey				MINETT			
Inventor's Signature						Date	
Residence: City	Manchester	State		Country	GB	Citizenship	GB
Post Office Address	14 St. Austell's Drive						
Post Office Address	Prestwich, Manchester M25 1LZ						
City	Manchester	State		ZIP	M25 1LZ	Country	GB
Name of Third Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.					
Given Name (first and middle (if any))				Family Name or Surname			
300 Grenville				SEAGER			
Inventor's Signature						Date	22/10/02
Residence: City	Newcastle Upon Tyne	State		Country	GB	Citizenship	GB
Post Office Address	49 Greystoke Avenue						
Post Office Address	Whickham, Newcastle Upon Tyne NE16 5HR						
City	Newcastle	State		ZIP	NE16 5HR	Country	GB
Name of Fourth Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.					
Given Name (first and middle (if any))				Family Name or Surname			
Adrian Lance				ENTWISTLE			
Inventor's Signature						Date	
Residence: City	Lancashire	State		Country	GB	Citizenship	GB
Post Office Address	410 Rochdale Road						
Post Office Address	Brittania, Bacup, Lancashire OL12 9SD						
City	Lancashire	State		ZIP	OL12 9SD	Country	GB

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DECLARATION**ADDITIONAL INVENTOR(S)
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Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Grenville <i>fw</i>		SEAGER	
Inventor's Signature		Date	
Residence: City Manchester	State	Country GB	Citizenship GB
Mailing Address 87 Bury New Road <i>CBY</i>			
Mailing Address Whitefield, Manchester M45 7EG			
City Manchester	State	ZIP M45 7EG	Country GB
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Adrian Lance <i>allan</i>		ENTWISTLE	
Inventor's Signature		Date 8-May 01	
Residence: City Lancashire	State	Country GB	Citizenship GB
Mailing Address 410 Rochdale Road <i>CBY</i>			
Mailing Address Brittania, Bacup, Lancashire OL12 9SD			
City Lancashire	State	ZIP OL12 9SD	Country GB
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Craig Lee <i>CL</i>		CROSBY	
Inventor's Signature		Date 17/5/01	
Residence: City Cheshire	State	Country GB	Citizenship GB
Mailing Address 81 Staley Hall Road <i>CBY</i>			
Mailing Address Stalybridge, Cheshire SK15 3DP			
City Cheshire	State	ZIP SK15 3DP	Country GB

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John V. Moriarty	#26,207		
John C. McNett	#25,533		
Thomas Q. Henry	#28,309		
James M. Durlacher	#28,840		
Charles R. Reeves	#28,750		
Vincent O. Wagner	#29,596		
Steve Zlatos	#30,123		
Spiro Bereveskos	#30,821		
William F. Bahret	#31,087		
Clifford W. Browning	#32,201		
R. Randall Frisk	#32,221		
Daniel J. Lueders	#32,581		
Kenneth A. Gandy	#33,386		
Timothy N. Thomas	#35,714		
Kerry P. Sisselman	#37,237		
Kurt N. Jones	#37,996		
John H. Allie	#39,033		
Holiday W. Banta	#40,314		
Troy J. Cole	#35,102		
L. Scott Paynter	#39,797		
J. Andrew Lowes	#40,706		
Charles J. Meyer	#41,996		
Matthew R. Schantz	#40,800		
Gregory B. Coy	#40,967		
Lisa A. Hiday	#40,036		
John V. Daniluck	#40,581		
Christopher A. Brown	#41,642		
C. John Brannon	#44,557		
Jason J. Schwartz	#43,910		
Arthur J. Usher, IV	#41,358		
Douglas A. Collier	#43,556		
Brad A. Schepers	#45,431		
James B. Myers	#42,021		
Scott J. Stevens	#29,446		
John M. Bradshaw	#46,573		
C. Amy Ng Smith	#42,931		
Charles P. Schmal	#45,082		
Edward E. Sowers	#36,015		

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